FINDING OF NO SIGNIFICANT IMPACT
South Rim and North Rim Firing Range Rehabilitation
Grand Canyon National Park

Grand Canyon National Park proposes to rehabilitate the South Rim and North Rim firing ranges. The purpose of this project is to reduce the current levels of lead that have been deposited in the soil at the two firing ranges, to prevent further lead deposits from accumulating with the installation of a bullet-collection system at each range, and to upgrade and improve range facilities. This proposal is needed in order to address the following management concerns:

- Lead is accumulating in the earthen backstops used at both ranges. The North and South Rim Firing ranges have been in operation at the Grand Canyon for at least thirty years. Both ranges are used year-round, and it is estimated that at least 30,000 rounds are being fired each year at the park. Although lead cleanup is not a legal requirement for the National Park Service until a range ceases to operate, addressing the cleanup of lead now will be environmentally proactive and will likely be less costly to the park in the long run. Firing ranges in general have also been identified as a potential risk site to the federally listed California condor (California Recovery Team, Jan. 2003).
- There is currently no adequate system in place to prevent further lead deposits from accumulating at the two sites. Installation of a bullet-catching system at each range is necessary to prevent further accumulations and to allow for appropriate lead collection and disposition.
- Rehabilitation of the facilities at the two firing ranges is needed so that facilities meet current National Rifle Association (NRA) standards for firing ranges.

In April 2003 the National Park Service (NPS) prepared an *Environmental Assessment/Assessment of Effect (EA/AEF) for the South Rim and North Rim Firing Range Rehabilitation*. The preferred alternative was selected after a careful review of resource and visitor impacts and public comments. Concerns identified during scoping and evaluated in the EA/AEF include soils and water, special status species (i.e. Mexican spotted owl and California condor), and park operations.

PREFERRED ALTERNATIVE

The preferred alternative (Alternative B) consists of placing a "backstop" of loose, shredded rubber on a reinforced concrete base cast on compacted earthen berms at both ranges. With this system, bullets are captured without fragmentation and migrate toward the bottom of the rubber for easy retrieval. The media consists of recycled rubber tires, and the spent bullets can be easily retrieved as scrap metal. Although the shredded rubber system ranks highest in initial cost, it has the lowest maintenance costs of any of the other proposals. It also outranked the other alternatives in providing the most bullet containment without fragmentation or potential contamination to the soil. Fragmented bullets will not come in contact with surface water with this system, nor will it have any seasonal limitations.

Under the preferred alternative, the following actions will be implemented:

1. **Lead reduction**
   Lead reduction activities will be initiated. Before any bullet catching system is installed, soil from the areas with heaviest concentrations of lead at both ranges will be cleaned and recycled. Initial clean up will be accomplished with heavy equipment. A front-end loader will be used to scoop dirt from the earthen backstops and to fill dump trucks for removal from the site. Some of the dirt may be screened onsite and the lead removed for recycling.

2. **Rehabilitation of Existing Facilities**
   Existing facilities at both firing ranges will be rehabilitated. At the South Rim range, a small metal storage shed will be added at the south end of the range. The existing eight lanes will be retained. At the North Rim, three of the existing five lanes will be eliminated.

MITIGATION MEASURES

The mitigation measures listed below are considered part of the preferred alternative and will be followed during project implementation. These actions were developed to lessen the potential for adverse impacts from implementing the preferred alternative, and have proven to be very effective in reducing environmental impacts on previous projects.

- Contractors working in the Park are given orientation concerning proper conduct of operations. This orientation is provided in both written form and verbally at a preconstruction meeting. This policy will continue for this project.
- All staging areas will be in previously disturbed sites and will be returned to pre-construction conditions once construction is complete. Standards for this, and methods for determining when the standards are met, will be developed in consultation with the Grand Canyon National Park vegetation program leader.
- If dust becomes a problem during work, sprinkling with water will occur to reduce dust, both on roadways used and/or in the construction site. Reclaimed water will be used whenever available.
- Construction equipment will not idle any longer than the minimum needed for proper mechanical operation.
- Construction zones will be fenced with construction tape, snow fencing, or some similar material before any construction activity. The fencing will define the construction zone and confine activity to the minimum area required for construction. All protection measures will be clearly stated in the construction specifications and workers will be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.
- Prior to construction activities, a park Restoration Biologist will survey the site for exotic species so that exotics can be treated. Some small seedlings and saplings may need to be removed prior to disturbance. Vehicles used at the site will be pressure-washed prior to entering the park to further minimize the introduction of exotic species. Construction workers and supervisors will be informed about special status species. Contract provisions will require the cessation of construction activities if a species were discovered in the project area, until park staff re-evaluates the project. This will allow modification of the contract for any protection measures determined necessary to protect the discovery.
- To protect any unknown or undiscovered threatened, endangered, or special status species, the construction contract will include provisions for the discovery of such. These provisions will require the cessation of construction activities until Park staff evaluates the project impact on the discovery and will allow modification of the contract for any protection measures determined necessary to protect the discovery. Mitigation measures for known special status species are as follows:

  <u>California Condor</u>

  a. Prior to the start of the project, the Park will contact personnel monitoring California condor locations and movement within the Park to determine the locations and status of condors in or near the project area.

b. If a condor occurs at the construction site, construction will cease until it leaves on its own or until permitted personnel employ techniques that result in the individual condor leaving the area.
c. Construction workers and supervisors will be instructed to avoid interaction with condors and to contact the appropriate Park or Peregrine Fund personnel immediately if condors are sighted at a construction site.
d. The construction site will be cleaned up at the end of each day that work is being conducted (i.e., trash disposed of, scrap materials picked up) to minimize the likelihood of condors visiting the site. Park condor staff will complete a site visit to the area to ensure adequate clean-up measures are taken.
e. To prevent water contamination and potential poisoning of condors, a vehicle fluid leakage and spill plan will be developed and implemented for this project. This plan will be reviewed by the Park biologist for adequacy in addressing condors.
f. If condor nesting activity is known within 0.5 mile of the project area, then light and heavy construction in the project area will be restricted during the active nesting season, if viable nests persist. The active nesting season is February 1 to October 15, or until young are fully fledged. These dates may be modified based on the most current information, in consultation with the Park biologist and the USFWS. No blasting will be necessary for the completion of this project.

Mexican Spotted Owl (MSO). There are currently no known MSO Protected Activity Centers (PAC) within a mile of either the North Rim or the South Rim firing ranges. For this reason, there is currently no need for any mitigation measures pertinent to MSO to apply to implementation of the project. However, should new MSO PACs be located in the vicinity of the project areas prior to project implementation, the following conservation measures will be implemented:

a. If the project occurs within a Protected Activity Center (PAC) with no known nest site, then all construction activity will be restricted to the non-breeding season (September 1 – February 28). However, if the project in a PAC is at least 0.8 km (0.5 mile) from known nest sites then the project can be implemented during the breeding season. The breeding season is March 1 – August 31. No blasting will be necessary for the completion of this project.
b. If a construction project outside of PACs occurs within 0.8 km (0.5 mile) of a known PAC nest or roost site, the boundary of a PAC where the nest or roost site is not known, or unsurveyed restricted, protected, or predicted MSO habitat, then light and heavy construction activity in that project area will be restricted to the non-breeding season (September 1 – February 28).

- If previously unknown archeological resources are discovered during construction, a park archeologist will be contacted immediately. All work in the immediate vicinity of the discovery will be halted until the resources could be identified and documented and an appropriate mitigation strategy developed. This will be done in accordance with the stipulations of the 1995 Programmatic Agreement Among the National Park Service, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the General Management Plan/Environmental Impact Statement, Grand Canyon National Park, Arizona.
- All workers will be informed of the penalties for illegally collecting artifacts or intentionally damaging any archeological or historic property. Workers will also be informed of the correct procedures if previously unknown resources were uncovered during construction activities.
- To minimize the potential for impacts to park visitors, variations on construction timing will be considered. Unless additional time is authorized by park management, operation of construction equipment will not occur between the hours of 6 PM to 7 AM in summer (May – September), and 6 PM to 8 AM in the winter (October – April). Adherence to these hours will minimize the impacts of noise from construction activities to visitors and will help preserve the Canyon's natural quiet.

- To further minimize the potential for impacts to park visitors, the section of Arizona Trail near the North Rim firing range will be posted with additional signage to inform visitors of the presence of the firing range. A road extending from the Trail to the firing range will be blocked at the Arizona Trail with a locked gate. Rangers accessing the range will also do a check for dispersed campers in the vicinity of the range prior to using the range for practice.

ALTERNATIVES CONSIDERED

The EA/AEF evaluated four alternatives in detail for addressing the purpose and need for action: the No Action alternative, the Preferred alternative, and two additional action alternatives. The preferred alternative was previously described in detail in this document.

No Action Alternative (Alternative A)

Alternative A does not meet the purpose and need for the project, but provides a baseline for comparison with the action alternatives. Alternative A will maintain the existing conditions at the firing ranges. Lead has accumulated in the earthen backstops at both ranges, over their many years of use. The reason that lead has been allowed to accumulate in the earthen backstops is that there is no system in place that will allow efficient clean up. Existing facilities will be left in a deteriorated condition.

Rubber Blocks (Alternative C)

This alternative includes those items applicable to all action alternatives, as described under the preferred alternative. In addition, this alternative will include the placement of rubber blocks with rubber back-up panels and a steel support frame. Bullets are captured in the solid blocks of recycled rubber; however, the manufacturer's representative did not have any data proving that the channels within the rubber blocks were effective in the recovery of spent bullets and lead shot. When the blocks meet a maximum capacity of lead, they must be either repositioned to a little-used area of the berm or disposed of as hazardous waste. To date, there is no smelter to perform this process, nor is there an efficient way to remove the spent bullets and lead from the blocks. Since the blocks can weigh up to 80 pounds, repositioning blocks will require the use of small equipment, such as a Bobcat.

Engineered Sand Berm (Alternative D)

This alternative includes those items applicable to all action alternatives as described under the preferred alternative. In addition, this alternative requires removal of the existing berm and installation of a new berm of engineered sand built to meet the standards needed for slope stability and acceptability for ballistics. These traps are typically 15-20 feet high. Spent bullets remain close to the point of impact in the berm. It is critical that the uppermost layer (to a depth of 1-2 feet) is free of large rock or other debris to prevent ricochet and bullet fragmentation and to facilitate reclamation. The sand material must be sifted every 2-3 years to minimize ricochet and fragmentation. Also, once the traps become saturated with bullets, the sand must be sifted to remove the bullets. Some hazardous waste may be generated over time, and bullet fragments could come into contact with surface water.

Several additional bullet-catching systems were also identified during the Value Analysis, but were subsequently dismissed from detailed analysis. These included:

- steel traps - dismissed because they are designed for shooting at a specified angle, a technology more appropriate for an indoor range; also generate an increase in lead dust and fragmented lead.
- *SACON* (Shock Absorbing Concrete) - dismissed because it is not yet available for small arms ranges.
- bentonite traps - dismissed because of ricochet and fragmentation risks.
- granular rubber traps - dismissed as suitable only for high volume rounds per year.
- use of wooded areas backstops - dismissed because this could impede lead reclamation activities.
- filter beds (a combination of sand traps with limestone dolomite or gypsum) - dismissed because they are not effective in Arizona soils.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which guides the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101:

1) **Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.** The preferred alternative (B) will best promote long-term protection of the resources of wildlife, soils and water through the installation of a bullet-catching system that is easily cleaned and is nearly as passive as soil. There is no possibility of contamination to soil and water with this system. Rubber blocks (alternative C) will also provide an adequate bullet catching system; however, the manufacturer's representative could not provide data to show that the channels within the rubber blocks are effective in the recovery of spent bullets and lead shot. With the last alternative (D), an engineered sand berm, there may be some hazardous waste generated over time due to movement of lead through the sand. There is a possibility that bullet fragments could come into contact with surface water over time.
2) **Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings.** All of the action alternatives will improve existing facilities so that they meet NRA firing range standards, increasing safety and health of administrative staff who use the ranges.
3) **Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences**. The preferred alternative (B) provides the most containment without fragmentation of bullets or contamination of the soil and allows easy recovery of spent bullets for recycling. There is no possibility of contamination to soil and water with this system. Rubber blocks (alternative C) will also provide an adequate bullet catching system; however, the manufacturer's representative could not provide data to show that the channels within the rubber blocks are effective in the recovery of spent bullets and lead shot. With the last alternative (D), an engineered sand berm, there may be some hazardous waste generated over time due to movement of lead through the sand. There is also a possibility that bullet fragments could come into contact with surface water and soil.
4) **Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.** One portion of this criteria that applies to the current project is that the level of lead at these sites will be measurably reduced by any of the alternatives. The potential for wildlife to find and ingest lead will thus be appreciably reduced in the project areas. This project does not affect important historic and cultural aspects of our national heritage.
5) **Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.** All of the action alternatives will provide a high quality working environment for law enforcement staff, as well as promoting long-term protection of wildlife. With alternatives C and D, recovery of spent fragmented lead will not be as efficient as with the Preferred Alternative (B). With alternative D, an engineered sand berm, there may be some hazardous waste generated over time due to movement of lead through the sand. There is a possibility that bullet fragments could come into contact with surface water and soil.
6) **Enhance the quality of renewable resources and approach the maximum attainable recycling of depleteable resources.** The preferred alternative (B) will use recycled rubber for the bullet-containment system, and will facilitate easy long-term recycling of lead.

Alternative B is recommended as the environmentally preferred alternative. It meets both the purpose and need for action and the project objectives.

WHY THE PREFERRED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT ON THE HUMAN ENVIRONMENT

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria.

Impacts that may be both beneficial and adverse
As fully discussed in the EA/AEF, the preferred alternative will not affect air quality, soundscape, floodplains and wetlands, environmental justice, prime and unique farmland, cultural resources, vegetation, exotic vegetation and noxious weeds, visitor experience, socioeconomic environment, general wildlife populations, or certain species of interest (i.e., bald eagle, peregrine falcon, Northern goshawk, spotted bat and greater Western mastiff bat).

Soils and Water
Implementation of the preferred alternative will likely result in minor to moderate, long-term, beneficial impacts to soils and water. Lead will be removed from the areas of highest concentration at each range. Also, there is no possibility of hazardous waste being generated or direct or indirect contamination to ground water or soils.

Special Status Species
Implementation of the preferred alternative will result in negligible to minor, local, adverse, and long-term impacts to the Mexican spotted owl. For purposes of Section 7 consultation under the Endangered Species Act, implementation of the preferred alternative may affect, but is not likely to adversely affect Mexican spotted owls or their habitat.

Implementation of the preferred alternative will result in negligible to minor, local, short-term, adverse impacts to condors during construction activities; but will result in minor to moderate beneficial impacts as a result of the cleanup of lead at each range and the implementation of a bullet-catching system. For purposes of Section 7 of the Endangered Species Act, the preferred alternative may affect, but is not likely to adversely affect, the California condor.

Park Operations
The park evaluated impacts to park operations and found that implementation of the preferred alternative will result in minor to moderate long-term beneficial impacts on park operations, through improved park facilities. Also, an improved training ground is likely to positively impact morale and overall skill level of park law enforcement staff.

Degree of effect on public health or safety
There are recognized environmental hazards within the project area: specifically, expended lead bullets and powder on the existing backstop surfaces. With the preferred alternative, lead will be removed from the soil and prevented from entering the soil and groundwater.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas
As described in the EA/AEF, neither firing range, on the North Rim or the South Rim, has any proximity to historic or cultural resources. This project was sent to the State Historic Preservation Office for their information only. There are no prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas in the project area.

Degree to which effects on the quality of the human environment are likely to be highly controversial
There were no highly controversial effects identified during either preparation of the EA/AEF or the public review period.

Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks

Possible effects on the quality of the human environment or unique or unknown risks from this project relate to the possibility of lead leaching into the ground water from soils within the two firing ranges. It is highly unlikely that the firing ranges at GRCA will fall into this category because the alkaline soils and depth of water table lower considerably the potential of lead leaching through the soil into the water table. In Arizona, where we have relatively low rainfall and neutral to alkaline clay soils, it will be rare to have lead penetrate beyond the top 6-12 inches of soil. In the rare instance where rainfall was extremely high, it would be possible for lead compounds to migrate out of the range boundaries and to cause contamination to ground or surface water. Although the potential for impacts to soils and water from implementation of this project is considered negligible, the potential for mobility of the oxidized compounds generated from lead bullets is controlled by environmental factors such as intensity and frequency of rainfall, soil permeability and soil type. Implementation of the preferred alternative will minimize this risk of lead leaching into the soils by cleaning up the areas of highest lead concentration and installing an efficient bullet catching system to facilitate cleanup in the future.

Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration

The preferred alternative neither establishes a precedent for future actions with significant effect nor represents a decision in principle about a future consideration.

Whether the action is related to other actions with individually insignificant but cumulatively significant impacts

Impacts of the preferred alternative that were identified in the EA/AEF were to soils and water, special status species (Mexican spotted owl and California condor), and park operations. While it is difficult to quantify the level of effect, cumulative beneficial impacts are expected to be minor to moderate in all areas, when combined with other past, present and reasonably foreseeable future actions.

Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

Neither project area is located near a significant scientific, cultural, or historical resource. All project areas have been surveyed for cultural resources, and the potential for impacts to archeological sites is considered negligible. Consultation with the concerned tribal officials has been completed. The State Historic Preservation Office has concurred that no historic properties will be affected by this project. If previously unknown archeological resources are discovered during construction, all work in the immediate vicinity of the discovery will be halted until the resources are identified and documented.

Degree to which the action may adversely affect an endangered or threatened species or its critical habitat

The California condor was listed as an endangered species in 1967. A nonessential, experimental population of California condors has been established in Northern Arizona, and within Grand Canyon National Park the condor has the full protection of a threatened species. It has been determined by park staff that implementation of the preferred alternative "may affect, but is not likely to adversely affect" the California condor. This determination is based on the potential that condors could be attracted to the increased activity at the project site during construction. Mitigation measures have been developed jointly between park staff and the U.S. Fish and Wildlife Service (FWS) to minimize the potential for adverse impacts to the condor during project implementation. These measures are included as part of the proposed action and identified under the preferred alternative. The FWS has been consulted and concurred with the determination that condors may be affected, but are not likely to be adversely affected by the implementation of the preferred alternative.

The Mexican spotted owl was listed as a threatened species in 1993 and parts of Grand Canyon National Park were designated as critical habitat in 2001. It has been determined by park staff that implementation of the preferred alternative "may affect, but is not likely to adversely affect" MSO. This determination is based on the fact that the project area has been surveyed and no owls have been detected in the project area, the project site is not considered MSO critical habitat, and the nearest Protected Activity Center is greater than 0.5 miles away. Mitigation measures have been developed jointly between park staff and the U.S. Fish and Wildlife Service (FWS) to minimize the potential for adverse impacts to the MSO during project implementation. These measures are included as part of the proposed action and identified under the preferred alternative. The FWS has been consulted and concurred with the determination that MSO may be affected, but are not likely to be adversely affected by implementation of the preferred alternative.

For purposes of Section 7 consultation under the Endangered Species Act, implementation of the preferred alternative may affect, but is not likely to adversely affect, the Mexican spotted owl or California condor. Concurrence on these determinations was received from the U.S. Fish and Wildlife Service on 9 July 2002, as part of a batch consultation on multiple construction projects in the park.

Whether the action threatens a violation of Federal, state, or local environmental protection law

The preferred alternative violates no federal, state, or local environmental protection laws. As active small-arms ranges, the Grand Canyon range facilities are not subject to requirements under the Resource Recovery and Conservation Act (RCRA 1976)) or the Military Munitions Rule (Dec. 2000).

IMPAIRMENT

In addition to determining the environmental consequences of the preferred and other alternatives, National Park Service policy (*Management Policies*, 2001) requires analysis of potential effects to determine whether or not actions will impair park resources. The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of the park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, will harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values. Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. An impact to any park resource or value may constitute impairment. An impact will be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Because there will be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there

will be no impairment of Grand Canyon National Park's resources or values as a result of implementation of the preferred alternative.

PUBLIC INVOLVEMENT

The firing range rehabilitation proposal was included in a public scoping letter that was submitted to a 300-person Grand Canyon National Park mailing list on February 20, 2003. From these public scoping activities, four responses were received. One respondent questioned the need to have firing ranges within park boundaries. The EA/AEF addresses the historical use and need for firing ranges within the Park on page 6. Other responders either offered no specific comment on the proposal and thanked the park for keeping them informed, or were in support of the proposal as described. The environmental assessment was made available for public review and comment during a 30-day period ending July 21, 2003. No substantive comments were received.

CONCLUSION

The preferred alternative does not constitute an action that normally requires preparation of an environmental impact statement (EIS). The preferred alternative will not have a significant effect on the human environment. Negative environmental impacts that could occur are minor or moderate in intensity. There are no significant impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

Recommended: _____ 10/6/03
Jeff Cross, Science Center Director — Date
Grand Canyon National Park

Recommended: _____ 10-14-03
Joseph F. Alston, Superintendent — Date
Grand Canyon National Park

Approved: _____ 10/27/03
Stephen P. Martin
Intermountain Regional Director — Date

ERRATA SHEET

South Rim and North Rim Firing Range Rehabilitation
Grand Canyon National Park

Add to page 20 of EA (1. Lead Reduction; after "existing earthen berm backstop (Figure 5)."-
When funds are available, the project will also include cleanup of spent shell casings lying in the gravel surface of the range firing area. Additionally, if funds allow, the range surface would be hardened by mixing the in-situ native soil with minimal Portland cement and water. This will provide a durable surface and easier collection in the future of shell casings. Anticipated methods of implementation would entail a front-end loader scooping the top 6"-8" of gravel, spent shells, and soil off the range surface; then screening this to separate and return the cleaned soil. A tractor pulling a rake would mix in the prescribed cement; then the area would be watered and rolled for compaction.